REMARKS

In response to the non-final Office Action of May 28, 2009, applicant asks that all claims be allowed in view of the amendments and the following remarks.

Claims 1, 7, 18, 28, 59, 64, 66, 71-74, and 76-93 are pending, with claims 1, 18, 76, and 82 being independent. Claims 2-6, 8-17, 19-27, 29-58, 60-63, 65, 67-70, and 75 have been cancelled without prejudice or disclaimer of subject matter. Claims 1, 71, 76, 78, and 85 have been amended, and claims 88-93 have been added. Support for the amendments and the new claims is found in the application at, for example, page 15, line 25 to page 18, line 7 and FIGS. 1A-1C, 2A-2C, and 3A-3C. No new matter has been added.

Claim Rejections—35 U.S.C. § 103

Claims 1, 7, 18, 20, 21, 28, 59, 60, 63-66, and 71-87 have been rejected as being unpatentable over U.S. Patent No. 6,373,454 (Knapp) in view of U.S. Patent No. 6,369,786 (Suzuki) and U.S. Patent Application Publication No. 2003/0231152 (Shin). Applicant requests withdrawal of this rejection for the reasons discussed below.

Among other features, amended independent claim 1 recites a driven circuit including a first transistor, a signal line electrically connected to the first transistor through a node, a precharge circuit electrically connected to the signal line and including a second transistor, and a current source electrically connected to the first transistor and the second transistor. A gate width of the second transistor is larger than a gate width of the first transistor.

None of Knapp, Suzuki, and Shin, nor any proper combination of the three, describes or suggests that a gate width of a second transistor is larger than a gate width of a first transistor. Moreover, even if Knapp and Suzuki could somehow be combined, it would not have been obvious to further modify Knapp and Suzuki with Shin in the manner suggested by the Office.

Knapp relates to an active matrix display device. See Knapp at abstract. In Knapp, a switch 33 connects a display element 20 to a drive transistor 30. See Knapp at col. 6, lines 21-25 and FIG. 2. When the switch 33 is closed, the transistor 30 draws current through the display element 20 so as to produce the required amount of light from the display element 20. See

Knapp at col. 6, lines 50-53. An input line 35 connects a switch 37 to a node 36 (see Knapp at col. 6, lines 39-43), and an input signal I_{in} corresponding to the current required for the display element 20 is driven through the transistor 30 via the input line 35 (see Knapp at col. 6, lines 63-75 and FIG. 2).

Suzuki discloses a matrix driving apparatus (or matrix drive) that includes scanning electrodes and signal electrodes, and a precharge circuit connected to the signal electrodes. See Suzuki at col. 3, lines 52-64. In one aspect of Suzuki, a precharge circuit 3A includes diodes D_1 to D_x, each of which is connected to a corresponding one of signal electrodes SiE_1 to SiE_x. See Suzuki at col. 5, lines 50-52 and FIG. 7.

Shin relates to an image display having pixels that are formed at an intersection of scan and data lines. See Shin at ¶ 0008. Each of the pixels includes a light-emitting element and two transistors of different sizes, M1 and M2, that form a current mirror. See Shin at ¶ 0014, ¶ 0016, and FIG. 2.

However, none of these references describes or suggests the noted features of claim 1.

The Office appears to equate Knapp's transistor 30 with the recited first transistor and Suzuki's diode D_x included in the precharge circuit 3A with the recited second transistor. See the Office Action at page 4. The Office acknowledges that neither Knapp nor Suzuki disclose a pre-charge circuit that includes the second transistor or that a gate width of the second transistor is larger than a gate width of the first transistor. See the Office Action at page 4. For this feature, the Office relies Shin stating that "it would have been obvious to modify Knapp and Suzuki with the teachings of Shin, gate width of the second transistor being larger than the gate width of the first transistor, because it allows for greater current to flow from the precharge circuit, which allows for a faster precharge." Applicant respectfully disagrees.

First, the Office's rationale for combining Knapp and Suzuki with Shin does not provide a sufficient reason for combining these references. The Office equates Suzuki's diode D_x with the recited second transistor. However, Suzuki's diode D_x is connected to a power source 5A that supplies a constant current. Thus, even if a gate width of a transistor that acts as the diode D_x could be increased, the amount of current that flows through the diode D_x would not change

because the current that flows through the diode D_x is supplied by a constant current source. As a result, greater current would not flow through the diode D_x if the gate width was increased. Thus, because a constant amount of current flows through D_x from the constant current source, there would have been no reason to increase the gate width of the diode D_x.

Second, in the Response to Argument section on page 2 of the Office Action, the Office notes that "Shin was merely cited to show that transistors could have different sizes and that the sizes of the transistors affect the amount of current flowing through the transistor." Thus, the Office appears to rely on Shin to compare the amount of current that would flow through a particular transistor if the size of the transistor were to change rather than comparing the sizes of two different transistors. Although the size of a transistor affects the amount of current that flows through the transistor, this alone does not demonstrate that, if Knapp and Suzuki could somehow be combined and further modified with Shin, the gate width of Suzuki's diode D_x (which the Office equates with the recited second transistor) would be larger than the gate width of Knapp's transistor 30 (which the Office equates with the recited first transistor). Thus, even if Shin could be combined with Knapp and Suzuki, the combination would not describe or suggest that a particular transistor has a gate width that is greater than the gate width of another particular transistor.

Third, although Shin discloses that the transistor M1 and the transistor M2 have different channel widths, there is no indication that either of these transistors have a gate width that is larger than a gate width of the other. As explained in the applicant's specification, advantages arise from having the gate width of the second transistor larger than a gate width of the first transistor. These advantages are not provided by Shin, and none of the advantages appear to be benefits that Shin would seek. In a non-limiting example drawn from the applicant's specification, the optimum precharge voltage changes when the signal current supplied to the driven circuit changes, and the second transistor is used to generate an optimum precharge voltage in accordance with the signal current. See application at page 16, lines 24-26. For example, the signal current may be made smaller when precharging by adjusting the size of the second transistor by making the gate width of the second transistor large or the gate length of the

second transistor small. See application at page 17, lines 3-10. As discussed in the application at page 14, line 14 to page 15, line 9, making the signal current smaller may be advantageous because

> ... by inputting a small signal current before inputting a larger signal current, a steady state can be obtained more quickly than the case of inputting a large signal current first and a steady state is obtained (an optimum precharge voltage for a large current) and then a small signal current is inputted. That is, a stationary state can be obtained more quickly when performing a precharge with an optimum precharge voltage when the signal current I is 10 mA than with the optimum precharge voltage when the signal current I is 20 mA.

By contrast none of Knapp, Suzuki, or Shin's techniques appear to provide such a benefit. Nowhere do Knapp or Suzuki describe or suggest transistors with different gate lengths or widths. Although Shin mentions that the transistors M1 and M2 have different channel widths, one of skill would not have been motivated to make the current flowing through either of the transistors M1 or M2 smaller by making the gate width of one transistor larger relative to the gate width of the other because Shin explains in paragraph 0016 that "the current flowing to the transistor M2 is higher than that flowing to the transistor M1 in a predetermined proportion." This predetermined proportion is such that an OLED coupled to M1 can be driven with a current having a magnitude in a desired brightness range, while increasing the current from M2 for driving the data line. See Shin at ¶ 0016. Accordingly, even if Shin's transistors M1 and M2 could somehow be used to modify the transistor 30 Knapp and the diode D_x Suzuki, it would not have been obvious to modify these transistors to have the gate widths recited in claim 1.

For at least these reasons, Knapp, Suzuki, and Shin, alone or in combination fail to describe or suggest a driven circuit including a first transistor, a signal line electrically connected to the first transistor through a node, a precharge circuit electrically connected to the signal line and including a second transistor, and a current source electrically connected to the first transistor and the second transistor, where a gate width of the second transistor is larger than a gate width of the first transistor, as recited in independent claim 1.

Accordingly, applicant requests reconsideration and withdrawal of the rejection of claim 1 and its dependent claims.

Among other features, amended independent claim 76 recites a driven circuit including a first transistor, a signal line electrically connected to the first transistor through a node, a precharge circuit electrically connected to the signal line and including a second transistor, and a current source electrically connected to the first transistor and the second transistor, where a gate length of the second transistor is smaller than a gate length of the first transistor. Thus, claim 76 is allowable for reasons similar to those discussed with respect to claim 1. Accordingly, applicant requests reconsideration and withdrawal of the rejection of independent claim 76 and its dependent claims.

Among other features, independent claim 18 recites a driven circuit including a first transistor, and a precharge circuit comprising a second transistor, where a gate width of the second transistor is larger than a gate width of the first transistor. Independent claim 82 recites that a gate length of the second transistor is smaller than a gate length of the first transistor. Thus, independent claim 18 is allowable for reasons similar to those discussed above with respect to claim 1, and independent claim 82 is allowable for reasons similar to those discussed above with respect to independent claim 76. Accordingly, applicants request reconsideration and withdrawal of the rejection of independent claims 18 and 82 and their dependent claims.

New Claims 88-93

New claims 88-93 depend from one of independent claims 1, 18, 76, and 82. Accordingly, these claims are allowable over Knapp, Suzuki, Shin and any proper combination of the three for at least the reasons that the independent claims are allowable.

Conclusion

Applicant submits that all claims are in condition for allowance.

It is believed that all of the pending issues have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession

of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this reply should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this reply, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

No fees are believed due. Nonetheless, please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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Meghan A. McGovern
Reg. No. 60,476

Fish & Richardson P.C.
1425 K Street, N.W.
11th Floor
Washington, DC 20005-3500
Telephone: (202) 783-5070
Facsimile: (877) 769-7945
40588243.doc